

Play And Win A General Game Player

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Player Components

1. Proxy
2. GDL parser
3. Rule optimizer
4. Single player game player
5. Multiplayer game player

Proxy

- ▶ Acts as mediator between the gamemaster and the game player.
- ▶ Collects answer from random player (also monte carlo single player) and actual player. Priority: actual player.
- ▶ Java

GDL Parser and Rule Optimizer

- ▶ GDL Parser
 - ▶ Definite Clause Grammar.
 - ▶ Add prefix (ours: paw) in front of terms to avoid clashes with Prolog built-in predicates.
 - ▶ Transforms kif file to prolog file.
- ▶ Rule Optimizer
 - ▶ Recognizes successor, greater than and smaller than relations, and cyclic groups.
 - ▶ Template matching for step counter and noop moves.

Single Player Game Player

- ▶ DFS with step counter as depth controller.
- ▶ Avoid repeated states (by excluding step counter).

Multiplayer Game Player

- ▶ Monte Carlo with Upper Confidence bounds applied to Trees.

- ▶
$$UCTValue(node) = \frac{Wins + \frac{AccuScore}{7000}}{Visits} + \sqrt{\frac{\ln(AllVisits)}{5 * Visits}}$$

- ▶ Build tree of depth two only.
- ▶ Avoid repeated states (by excluding step counter) during a run to the goal.